

Dewatering Activities at Pabco Road March 2 through June 9, 2000

Prepared for

Clark County Parks and Recreation

By

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## INTRODUCTION

This report describes dewatering activities and documents perchlorate releases to Las Vegas Wash as a result of construction of the Pabco Road Erosion Control Structure as specified in the revised Rolling Stock Permit # TNEV99008. It was agreed on a conference call with the NDEP that a single report would be prepared to describe dewatering activities for the period when aggressive dewatering was being performed rather than a series of monthly reports. Minor dewatering events associated with construction of the Henderson Outfall Diversion portion of the Pabco Road Project have been previously reported (report dated 3/31/00). No dewatering was performed between March 2 and March 27. The aggressive dewatering activities for this project began March 28<sup>th</sup> and continued with major discharges to Las Vegas Wash until June 9, 2000 at which time discharges to the wash were terminated and all dewatering was directed to the project infiltration ponds. Dewatering activities after June 9<sup>th</sup> may result in small discharges to the wash depending on infiltration pond management needs. Any discharges after June 9<sup>th</sup> will be reported in a subsequent project report.

## DOCUMENTATION OF PUMPING VOLUMES (FLOW)

Documentation of pumped water releases to Las Vegas Wash is presented as the flow readings of outfalls 1, 1A, and 1B. Documentation of pumped water outflows to infiltration ponds were designated as outfalls 2 and 2B. Recorded daily volumes of water pumped to Las Vegas Wash and to the infiltration ponds are presented in Table 1. The volume of water delivered to the wash or to the infiltration ponds was determined for each outfall by taking daily readings of totalizing flow meters for each outfall and subtracting the previous days readings. For example, the flow reading in thousands of gallons for outfall 1 on 3/28/00 was subtracted from the flow reading of the same meter on 3/29/00. This number was adjusted to a 24 hour total flow reading and then was used as the volume of water passing through that outfall between 3/28 and 3/29/00. The number of outfalls releasing water to the wash ranged from one to three during the period of record.

## MEASUREMENT OF TDS

Total Dissolved Solids were measured in effluent samples in March, April and May during dewatering activities (see Table 2). This measurement is specified in the Rolling Stock Permit and it was confirmed with Catherine Pool of NDEP that the measurements were to be made on dewatering effluent samples, not Las Vegas Wash samples. These data demonstrate that the TDS levels were higher in the effluent streams that were delivered to infiltration ponds (2, 2B) than in the effluent streams released to the Wash (1, 1A, 1B).

Table 1. Flow readings in thousands of gallons for all dewatering outfalls from March 28 through June 9, 2000. Outfall designation 1 indicates release to wash, 2 indicate infiltration pond release.

Date	Outfall 1	Outfall 1A	Outfall 1B	Outfall 2	Outfall 2B
3/28/00	0*	0*	0*	0*	Not Constructed
3/29/00	1308	2173	0	1035	Not Constructed
3/30/00	2275	2151	0	1024	Not Constructed
3/31/00	2991	1218	1162	1594	Not Constructed
4/1/00	3160	0	1421	1405	Not Constructed
4/2/00	3001	0	1320	1495	Not Constructed
4/3/00	3217	0	1536	724	Not Constructed
4/4/00	3084	0	0	1726	Not Constructed
4/5/00	3129	823	0	2172	Not Constructed
4/6/00	3199	256	1485	1817	Not Constructed
4/7/00	2991	110	1586	1735	Not Constructed
4/8/00	1997	0	1679	2321	Not Constructed
4/9/00	2340	0	1875	2497	Not Constructed
4/10/00	2345	0	1303	2579	Not Constructed
4/11/00	2661	Dismantled	1394	2227	Not Constructed
4/12/00	2771	Dismantled	0	2317	1324
4/13/00	2678	Dismantled	595	2239	1024
4/14/00	2397	Dismantled	726	2311	405
4/15/00	2644	Dismantled	1128	2247	598
4/16/00	2685	Dismantled	1431	2324	43
4/17/00	2678	Dismantled	888	2324	846
4/18/00	2738	Dismantled	769	2496	807
4/19/00	2634	Dismantled	883	2301	945
4/20/00	2742	Dismantled	856	2418	511
4/21/00	2627	Dismantled	1091	2359	733
4/22/00	2242	Dismantled	1226	2323	330
4/23/00	2260	Dismantled	1335	2271	414
4/24/00	2370	Dismantled	1415	2359	434
4/25/00	2449	Dismantled	1315	2243	514
4/26/00	2788	Dismantled	1262	2101	650
4/27/00	2732	Dismantled	1300	2025	547
4/28/00	2722	Dismantled	1319	2172	511
4/29/00	2676	Dismantled	1255	955	636
4/30/00	2712	Dismantled	1239	2133	614
5/1/00	2481	Dismantled	1159	1924	481
5/2/00	2941	Dismantled	1323	2092	500
5/3/00	2528	Dismantled	1185	1952	437
5/4/00	2916	Dismantled	1252	2173	609

Table 1. Continued

Date	Outfall 1	Outfall 1A	Outfall 1B	Outfall 2	Outfall 2B
5/5/00	2825	Dismantled	1061	2035	1680
5/6/00	2713	Dismantled	1328	1914	1420
5/7/00	2876	Dismantled	1972	2067	646
5/8/00	2560	Dismantled	1013	1833	1035
5/9/00	2858	Dismantled	1090	2073	1526
5/10/00	2787	Dismantled	959	2051	1012
5/11/00	2501	Dismantled	1180	1793	1472
5/12/00	2607	Dismantled	1076**	1779	1337**
5/13/00	2718	Dismantled	1233	1819	1854
5/14/00	2767	Dismantled	1210	1908	1760
5/15/00	2379	Dismantled	1051	1648	1596
5/16/00	2379	Dismantled	1062	1639	1604
5/17/00	2583	Dismantled	1186	1836	1683
5/18/00	2559	Dismantled	1160	1796	1679
5/19/00	2442	Dismantled	1088	1693	1181
5/20/00	2604	Dismantled	1155	1831	1903
5/21/00	2465	Dismantled	1063	1654	1225
5/22/00	2278	Dismantled	1001	1602	989
5/23/00	2346	Dismantled	823	1731	1384
5/24/00	2625	Dismantled	509	1612	1939
5/25/00	2777	Dismantled	21	1693	1624
5/26/00	2559	Dismantled	7	1678	1379
5/27/00	3173	Dismantled	7	2105	1755
5/28/00	2719	Dismantled	Shut off - 0	1773	1498
5/29/00	2331	Dismantled	0	1743	1490
5/30/00	3313	Dismantled	0	1977	1701
5/31/00	3117	Dismantled	0	1676	1419
6/1/00	2508	Dismantled	0	1679	827
6/2/00	1826	Dismantled	0	1747	1223
6/3/00	1081	Dismantled	0	1471	1315
6/4/00	1873	Dismantled	0	2120	1824
6/5/00	1331	Dismantled	0	2467	1783
6/6/00	1173	Dismantled	0	2744	1519
6/7/00	997	Dismantled	0	3300	2452
6/8/00	628	Dismantled	0	2946	2084
6/9/00	248	Dismantled	0	3398	1081

\* Volume of water released was calculated after the second day of flow readings.

\*\* Flow was estimated using previous 3 days readings due to meter failure.

Table 2. Total Dissolved Solid (mg/l) Measurements from Dewatering Outfall Samples.

Date	Outfall 1	Outfall 1A	Outfall 1B	Outfall 2	Outfall 2B
3/4/00	1520*	Not Const.	Not Const.	3070*	Not Const.
4/6/00	1920	1880	3160	2550	Not Const.
5/31/00	1950	Dismantled	Dismantled	2010	2180

\* TDS averages taken from well points which were included in the indicated outfalls.

### ESTIMATION OF PERCHLORATE LOADINGS

Loading of perchlorate to the wash was estimated by taking daily samples of each effluent stream and analyzing the samples on site for perchlorate using a Cole Parmer ion specific perchlorate probe. This probe is sensitive to perchlorate levels down to approximately 0.5 ppm but is reliable and reproducible at levels above 1 ppm. The average of the readings for the previous day and current day was used as the concentration of perchlorate in a given outfall stream. The loading for a given outfall in kg/day was calculated based on the total flow and average concentration of that outfall. The volume of water delivered to the wash in each effluent was multiplied by the on-site measurements of perchlorate concentrations to determine a total load of perchlorate per day per effluent stream.

All data was recorded on field data sheets which included sampling time, volume and concentration data of all outfalls. Total loading to the wash was calculated as the sum of data for all outfalls released to the wash for the 24 hour period prior to daily sampling event (See Figure 1). Total volume of water delivered to the infiltration ponds was recorded on the data sheets and a note of Not Released entered in the total load column. Release of dewatering effluent to the wash was concluded on 6/2/2000 with rerouting of all dewatering effluent to infiltration ponds on site.

Field QC check samples were measured each day along prior to and after measurement of outfall samples. These samples indicated accuracy of the probe to be very good in the 10 ppm range which was the concentration of a majority of the effluent samples. Approximately half way through the aggressive dewatering period, the probe became sluggish and was not providing QC results within 1ppm accuracy. The probe was replaced with a new one which corrected this problem. This information as well as daily operational notes is documented on the field data sheets. Copies of the original field data sheets were delivered to NDEP on a weekly basis and discussed on weekly conference calls with NDEP.

With 6 exceptions, all discharges within the 72 day aggressive dewatering period fell below the permitted daily loading of 182 kg/day as specified in the revised Rolling Stock Permit #TNEV99008 (see Figure 1). Five of these exceptions fell within the first 10 days of dewatering in which operation of the dewatering system was being tested and modified to provide optimal

dewatering performance and minimal perchlorate loading directly to the wash. Provision of daily loading estimates allowed corrective action to be applied to the dewatering pump/well performance configuration in a timely manner, resulting in only 1 exception to the loading limits occurring in the last 62 days of dewatering (see Figure 1). After 5/25/00 construction was at a stage where reduction of discharges to the wash and increasing diversion of pumping flows to the infiltration ponds was possible. This pattern of on-site management toward shutting down discharges to the wash is evident in the flow data for the various outfalls presented in Table 1 and in the total loading data depicted in Figure 1.

#### MEASUREMENT OF PESTICIDES, HERBICIDES, AND PCBS

As specified in the Rolling Stock Permit, one sample was taken and characterized for pesticides/herbicides. On 5/31/00 samples were taken from the effluent stream of outfall 2 to be analyzed for pesticides and herbicides. This effluent stream was used because the concentration of perchlorate was the highest in this outfall. It was assumed that if organic contaminants existed in the dewatering effluent, they would most likely be the highest in the same effluent stream in which perchlorate levels were highest.

Two one liter pre-cleaned sample bottles were provided by NEL laboratories for both pesticides and herbicide samples. The samples were collected by filling the bottles directly from the effluent stream, labeling and custody sealing the samples, and storing the samples on ice until delivery to the laboratory. Results of the analyses were provided on 6/8/00 which are included as Attachment 1. Samples were analyzed for organochlorine pesticides using method EPA 8081A, PCB's using EPA 8082, and Herbicides using EPA 8150.

All QA/QC reported by the laboratory was within acceptable ranges with the exception of results for Heptachlor which is reported as an estimate. Results indicated the presence of alpha, beta, and delta BHC near the detection limits of 0.1 ug/l. All other results for pesticides, herbicides and PCB's were below the detection limits (see Attachment 1).

#### SEDIMENT CONTROL

No observable sediment was discharged to the wash in the outfall discharges with one exception.

On 5/13/00 a muddy discharge was noted in outfall 1 during collection of perchlorate samples from the outfall. The contractor was immediately notified and the operations modified to clean up the discharge. Typically the discharges were very clear and devoid of sediment (see figure 2). It was apparent that the type of dewatering process used in this construction project did not pose a problem in terms of sediment loading to the wash. Each of the effluent streams was observed daily when samples were collected for perchlorate analysis.

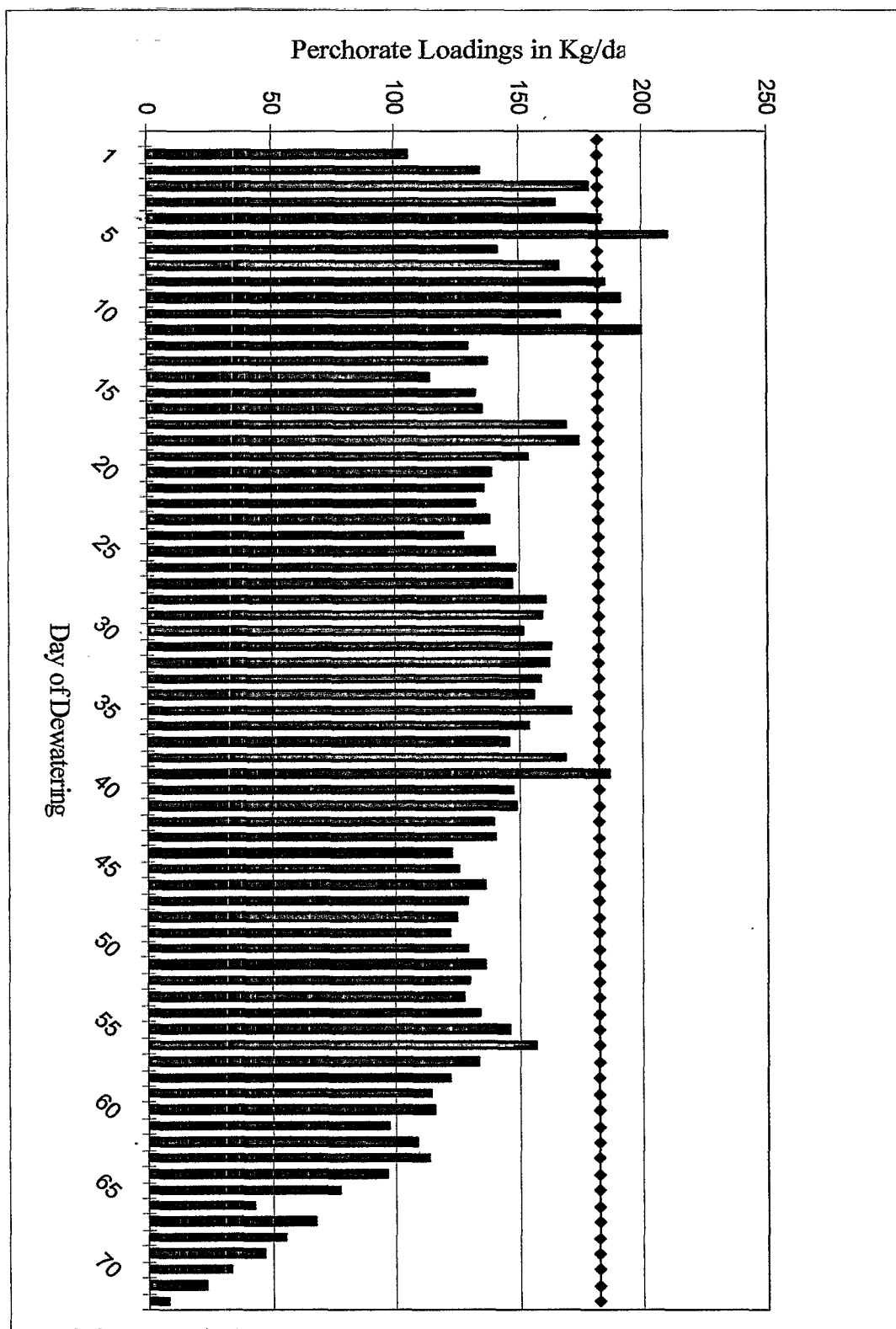
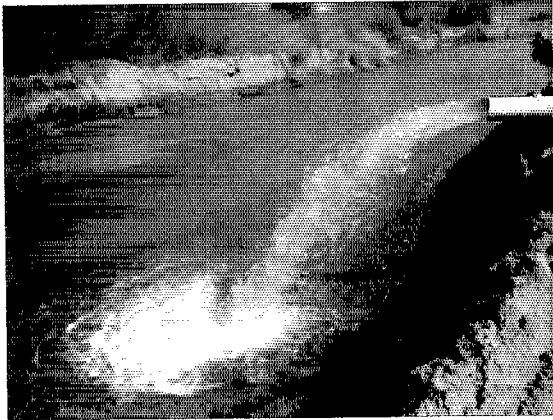


Figure 2. Daily Perchlorate loadings in kg per day from dewatering activities at Pabco Road. Permitted loading is 182 kg/day.

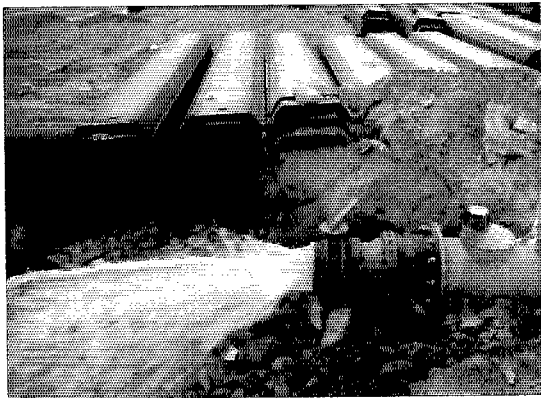




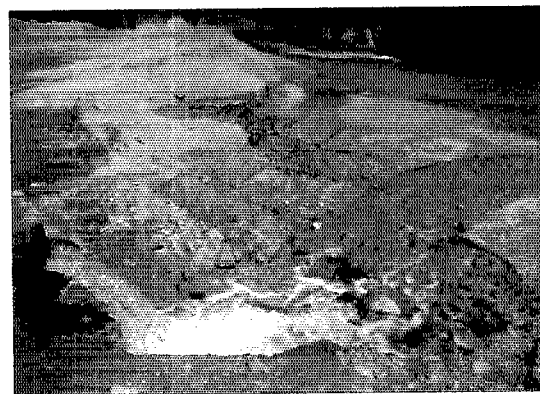
Outfall 1 Initial Placement of Discharge



Outfall 1 Final Discharge Placement



Outfall 1B Meter and Discharge



Outfall 1A Discharge



Outfall 2 Discharge



Outfall 2B Discharge

Figure 2. Discharge points 1, 1A, 1B, 2, and 2B.

## PERCHLORATE LOADING WITHIN THE WASH

Prior to initiation of the aggressive dewatering program which necessitated substantial discharge of perchlorate laden water to the wash, an analysis was performed using existing loading estimates based on within-wash data provided by SNWA. This information was used to establish the maximum daily loading (182 kg/day) allowed in the revised Rolling Stock Permit.

To evaluate if these estimates were realistic, and if the dewatering activities maintained perchlorate levels at or below historic wash concentrations, data were requested from SNWA which defined concentrations present in the wash prior to establishment of the Kerr McKee's Ion Exchange Treatment System and during the present dewatering program. The concentration within the wash prior to establishment of the Ion Exchange Treatment System (October 13, 1999) was 400 ug/l at Site LM6 which is approximately 1 mile downstream of Pabco Road. It was the goal of the project not to exceed this value. Data provided by SNWA for Site LM6 from 3/29 through 5/10/00, showed that concentrations within the wash ranged from 300 to 380 ug/l indicating that the historic target values were achieved. Additional data will be requested from SNWA which will be included in a final report for the project.